



National Weather Service Aberdeen, South Dakota



July 2011

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Heat Safety

Heat is the number one weather-related killer in the United States, resulting in hundreds of fatalities each year. In fact, on average, excessive heat claims more lives each year than floods, lightning, hurricanes and tornadoes combined. In the disastrous heat wave of 1980, more than 1,250 people died. In the heat wave of 1995, more than 700 deaths in the Chicago area were attributed to the heat. In August 2003, a record heat wave in Europe claimed an estimated 50,000 lives.

Here are some heat safety tips to help keep you and your family safe during the hot summer months.

- * **Slow down.** Reduce, eliminate or reschedule strenuous activity until the coolest part of the day. Children, seniors, and anyone with health problems should stay in the coolest available place, not necessarily indoors.

- * **Dress for summer.** Wear lightweight, light colored clothing to reflect heat and sunlight.

- * **Put less fuel on your inner fires.** Foods, like meat and other proteins that increase metabolic heat production, also increase water loss.

- * **Drink plenty of water or other non-alcohol or decaffeinated fluids.** Your body needs water to keep cool. Drink plenty of fluids even if you don't feel thirsty. Persons who have epilepsy or heart, kidney or liver disease, are on fluid restrictive diets or have a problem with fluid retention should consult a physician before increasing their fluid consumption. **Do not drink alcoholic beverages and limit caffeinated beverages.**

- * **During excess heat period, spend more time in air conditioned spaces.** Air conditioning in homes and other buildings markedly reduces danger from the heat. If you cannot afford an air conditioner, go to a library, store or other location with air conditioning for that part of the day.

- * **Don't get too much sun.** Sunburn reduces your body's ability to dissipate heat.

- * **Do not take salt tablets unless directed by a physician.**

- * **Never leave children or pets unattended in a vehicle, even with the windows down.** Teach children not to play in and around cars. Make sure safety buckles on child seats or seat belt buckles aren't too hot before securing your child in.

New Employee



Taylor Trogdon
Meteorological Intern

Taylor Trogdon was born in Columbia, MO where he did his undergraduate work at the University of Missouri-Columbia. During his time at Mizzou, he developed an interest in convective snow as he was a part of the Research on Convective Snows (ROCS) project and also the Profiling of Winter Storms (PLOWs) field campaign.

This interest took him to Creighton University in Omaha, NE where he did his graduate work. Taylor also worked for the Societal Impacts Program (SIP) where he developed an interest in the sociological impacts of weather on people. He attended the 2010 Weather and Society Integrated Studies (WAS*IS) Summer Workshop after working for the Societal Impacts Program at NCAR and applied this interest to his thesis. Blending both of his interests, societal impacts and winter weather, his thesis studied the perceptions of blizzards held by decision-makers and stakeholders in eastern NE and western IA. Taylor recently accepted a position as an Intern Meteorologist at the National Weather Service in Aberdeen, SD.

New

Summer vs. Winter Precipitation

Across the northern plains of South Dakota and west-central Minnesota, the average annual precipitation ranges between 15 and 25 inches. While there are no distinct “wet” or “dry” seasons, the average precipitation does vary by season. Statistically, precipitation in the summer months is normally the greatest, and July is the wettest month in most locations. In the winter months, precipitation amounts are normally lower, with most of the precipitation falling as snow.

While precipitation amounts are usually higher in the summer, the exact amount of rainfall that falls in any given location can vary significantly. In fact, there can be times when one section of town will experience heavy rainfall of an inch or two, whereas the other side of town receives no rainfall at all! The major reason for this is that rainfall during the summer is primarily from thunderstorms. The convective processes that produce thunderstorms often lead to a significant amount of rainfall in a short period of time – several inches per hour at times! However, the isolated nature of thunderstorms also produces sharp variations in the amount of rainfall over small distances.

These sharp gradients in rainfall were seen on 26 July 2011. The image below shows the rainfall amounts from 8pm to 9pm CDT on July 26th. Notice the sharp gradient in rainfall from Britton to Langford. Britton received in excess of 1.5 inches of rainfall between 8pm and 9pm, whereas Langford received less than 0.10.” A strong, slow moving thunderstorm moved right over Britton, and missed Langford.

CoCoRaHS is an acronym for the Community Collaborative Rain, Hail and Snow Network. CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow). Each time a rain, hail or snow storm crosses your area, volunteers take measurements of precipitation from as many locations as possible. These precipitation reports are then recorded on our Web site www.cocorahs.org. The data are then displayed and organized for many of our end users to analyze and apply to daily situations ranging from water resource analysis and severe storm warnings to neighbors comparing how much rain fell in their backyards.

Rainfall Amounts from 8pm to 9pm on 26 July 2011



Interesting facts about the July 15-20 heat wave

A persistent heat wave occurred over much of the central and northern U.S. July 15th-20th. A cold front then dropped through and brought temperatures back to near mid-July averages, and more importantly brought a much drier airmass into the region.

Below are a several other interesting facts about this recent heat wave:

- This was the worst heat wave to affect central and northeastern South Dakota and west-central Minnesota since July 2006. Beginning on Friday July 15th and persisting through Wednesday July 20th, many locations saw high temperatures rise into the 90s to low 100s, with low temperatures only falling into the 70s each night.
- In addition to the hot temperatures, humidity levels during this heat wave rose to extreme levels at times. Surface dewpoint values were commonly in the mid 70s Fahrenheit, which most people perceive as uncomfortable. However, at times, dewpoint values soared into the 80 to 83 degree range, which when combined with temperatures in the 90s to near 100 degrees, lead to very oppressive heat indices.
- Although not considered official weather records, the extremely high dewpoint temperatures recorded during this heat event were likely some of the highest values ever recorded in South Dakota. Research is ongoing to verify this fact. Below is summary of the highest dewpoint values recorded during this event:

City	Max Dewpoint Temperature	Date/Time
Sisseton	83F	7/17/11 — 5 PM CDT
Aberdeen	82F	7/17/11 — 9 PM CDT
Wheaton, MN	82F	7/17/11 — 115 PM CDT
Pierre	80F	7/16/11 — 8 PM CDT
Mobridge	80F	7/18/11 — 10 PM CDT
Watertown	80F	7/16/11 — 1 AM CDT

Several locations experienced their first 100 degree readings of 2011 as well. Pierre, Mobridge, Timber Lake, Murdo and Kennebec all reached 100 degrees during the July 17th-19th time period for the first time since August of 2010. Aberdeen reached 100 degrees on July 19th, which was the first time since July of 2007.



Average U.S. temperature increases by 0.5 degrees F

According to the 1981-2010 normals to be released by NOAA's National Climatic Data Center (NCDC) on July 1, temperatures across the United States were on average, approximately 0.5 degree F warmer than the 1971-2000 time period.

Normals serve as a 30 year baseline average of important climate variables that are used to understand average climate conditions at any location and serve as a consistent point of reference. The new normals update the 30-year averages of climatological variables, including average temperature and precipitation for more than 7,500 locations across the United States. This once-a-decade update will replace the current 1971-2000 normals.

In the continental United States, every state's annual maximum and minimum temperature increased on average. "The climate of the 2000s is about 1.5 degree F warmer than the 1970s, so we would expect the updated 30-year normals to be warmer," said Thomas R. Karl, L.H.D., NCDC director.

Using standards established by the World Meteorological Organization, the 30-year normals are used to compare current climate conditions with recent history. Local weathercasters traditionally use normals for comparisons with the day's weather conditions.

In addition to their application in the weather sector, normals are used extensively by electric and gas companies for short- and long-term energy use projections. NOAA's normals are also used by some states as the standard benchmark by which they determine the statewide rate that utilities are allowed to charge their customers.

The agricultural sector also heavily depends on normals. Farmers rely on normals to help make decisions on both crop selection and planting times. Agribusinesses use normals to monitor "departures from normal conditions" throughout the growing season and to assess past and current crop yields.

NCDC made many improvements and additions to the scientific methodology used to calculate the 1981-2010 normals. They include improved scientific quality control and statistical techniques. Comparisons to previous normals take these new techniques into account. The 1981-2010 normals provide a more comprehensive suite of precipitation and snowfall statistics. In addition, NCDC is providing hourly normals for more than 250 stations at the request of users, such as the energy industry.

Some of the key climate normals include: monthly and daily maximum temperature; monthly and daily minimum temperature; daily and monthly precipitation and snowfall statistics; and daily and monthly heating and cooling degree days. The 1981-2010 climate normals is one of the suite of climate services NOAA provides government, business and community leaders so they can make informed decisions. NOAA and its predecessor agencies have been providing updated 30-year normals once every decade since the 1921-1950 normals were released in 1956.

NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources. Visit us at <http://www.noaa.gov> or on Facebook at <http://www.facebook.com/usnoaagov>.

On the Web:

NOAA's National Climatic Data Center: <http://www.ncdc.noaa.gov>

NOAA Climate Services: <http://www.climate.gov>

1981-2010 Climate Normals Information: <http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html>

Widespread flood threat to continue through summer

Many rivers in the upper Midwest and northern Plains remain above flood stage, and the threat for more flooding will continue through the summer. With rivers running high and soils completely saturated, just a small amount of rain could trigger more flooding, including areas that have already seen major to record flooding. [NOAA's Climate Prediction Center](#) is forecasting above-normal rainfall in much of the region in the one- and three-month outlooks. Adding to the flood threat will be the rising temperatures over the Rockies, which will release the water from the remaining snowpack.

"The sponge is fully saturated – there is nowhere for any additional water to go," said Jack Hayes, Ph.D., director of NOAA's National Weather Service. "While unusual for this time of year, all signs point to the flood threat continuing through summer."

Forecasters say this season could rival the Great Flood of 1993, when the upper Midwest endured persistent, record-breaking floods from April through August, impacting nine states and causing more than \$25 billion in damages (adjusted for inflation).

As flood threats continue in these areas, NOAA's partners at the Federal Emergency Management Agency are continuing to support the response efforts in all of the impacted states. And they continue to urge all residents to take steps now to get ready for severe flooding and other hazards.

"The flooding that many Americans have already experienced this spring is a crucial reminder of just how devastating floods can be," said FEMA Administrator Craig Fugate. "As this forecast tells us, the response to this year's flooding is going to be a long effort – but we will be standing with all of the affected states, communities and families every step of the way. And this will continue to be a team effort – with the government working hand in hand with all of our partners, including states, tribal and local governments, non-profits, the private sector and most importantly, the public. If you haven't already, visit [ready.gov](#) to learn more about how you can protect your loved ones, homes and other properties from flooding, including by purchasing flood insurance."

Throughout the rest of the summer, the highest flood risk areas include:

- North Central United States including the upper Missouri River and Souris River (western North Dakota) and Red River of the North (border of North Dakota and Minnesota), Minnesota River (Minnesota), Upper Mississippi River (Minnesota and Iowa), and Des Moines River (Iowa)
- Lower Missouri River from Gavin's Point (Nebraska and South Dakota border) downstream along the border of Nebraska and Iowa, continuing along the borders of Kansas and Missouri then through Missouri to the Mississippi River
- Tributaries to the Lower Missouri including the James River flows in both North Dakota and South Dakota and the Big Sioux River in South Dakota
- Lower Ohio River Valley including the White, Wabash and lower Ohio River
- East of Rockies: North Platte River in Colorado, Wyoming and Nebraska and Yellowstone River in Wyoming and Montana
- West of Rockies: Utah and Colorado

Many factors set the stage for this year's ongoing flood threat, including persistent rainfall last summer and fall, a large winter snowpack across much of the upper Midwest, an unusually cool and wet spring adding additional snowpack in the higher elevations of the Rockies and further saturated soil in lower elevations and in the northern Plains, and above-normal to record river levels for this time of year in the at-risk areas.

In anticipation of these threats, FEMA has been working proactively with these states for months to prepare for and respond to flooding. Through its regional offices in Colorado, Missouri and Illinois, FEMA is continuing to closely monitor ongoing and potential flooding in these states, and is also working closely with our numerous federal

Flood threat (cont.)

partners, including the U.S. Army Corps of Engineers, the National Weather Service, and the U.S. Department of Agriculture, among others

To support states currently dealing with flooding, under the leadership of President Obama, FEMA is providing approved federal disaster assistance for Missouri, North Dakota, Iowa, Kansas, Nebraska, Montana and South Dakota. FEMA also currently has staff embedded in state emergency operations centers in Wyoming, Iowa, Kansas and Missouri to coordinate federal support efforts as needed. In addition, FEMA has field offices set up in North Dakota, South Dakota, Montana, Nebraska, Iowa, and Missouri to respond to ongoing and potential flooding, and has deployed commodities to North and South Dakota, in case they become needed. In preparation for this flooding season, FEMA also pre-staged commodities, including water, meals, and blankets, in strategic locations close to the flooding in Iowa, Kansas, Missouri and Nebraska, that may be requested for use by states. To learn more about FEMA's efforts, visit <http://blog.fema.gov/search/label/Floods>.

NOAA offers the following flood safety tips:

Determine whether your community is in a flood-risk area and continue monitoring local flood conditions at <http://water.weather.gov>.

Visit <http://www.ready.gov> for flood preparedness advice to safeguard your family, home and possessions and for more information about the National Flood Insurance Program.

Purchase a [NOAA Weather Radio](#) receiver with battery power option to stay apprised of quickly changing weather information.

- Study evacuation routes in advance and heed evacuation orders.

[Turn Around, Don't Drown](#) – never cross flooded roads, no matter how well you know the area or how shallow you believe the water to be.

NOAA's National Weather Service is the primary source of weather data, forecasts and warnings for the United States and its territories. NOAA's National Weather Service operates the most advanced weather and flood warning and forecast system in the world, helping to protect lives and property and enhance the national economy. Visit us online at weather.gov and on [Facebook](#).

NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources. Join us on [Facebook](#), [Twitter](#) and our other [social media channels](#).



Fischer's Lilly Park...Ft. Pierre, SD
June 7, 2011

Heat Index Chart

Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

- Caution
- Extreme Caution
- Danger
- Extreme Danger

NATIONAL WEATHER SERVICE

824 Brown County 14 South
Aberdeen, SD
57401

Phone: 605-225-0519

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Summer afternoon—
summer afternoon; to me
those have always been
the two most beautiful
words in the English lan-
guage.
~ Henry James

